

REMARKS

Claims 1-3, 5, 6, and 11-28 were previously pending in this application. Claims 1-3, 5-6, and 11-28 have been canceled. New claims 29-50 have been added. As a result, claims 29-50 are pending for examination with claims 29 and 43 being the independent claims. No new matter has been added.

Rejections Under 35 U.S.C. §102

Claims 1-3, 5, 6, and 11-17 stand rejected under 35 U.S.C. §102(b) as purportedly being anticipated by Cabuz et al., U.S. Patent No. 6,837,476 ("Cabuz"). Cabuz is directed to electrostatically actuated valves.

As provided above, previously presented claims 1-3, 5, 6, and 11-28, having been canceled, are no longer pending.

New Independent Claim 29

New independent claim 29 is directed to similar subject matter as previously pending independent claims 1 and 18, i.e., an integrated circuit chip that includes a pump. Support for this claim and its dependents can be found, at least, in Fig. 7 and paragraph [0056] of the published specification.

In particular, independent claim 29 includes an integrated circuit chip having a semiconductor substrate that includes at least one transistor, and also having a pump in fluid communication with a ventilating duct and configured to cool the chip.

Cabuz does not disclose a semiconductor substrate that includes at least one transistor. In fact, Cabuz provides no description at all of an electrostatically actuated valve that is incorporated in an integrated chip where the integrated chip includes a semiconductor substrate that includes at least one transistor. Indeed, Cabuz teaches no more than a valve that is surrounded by opposing walls. For instance, Fig. 1 of Cabuz illustrates a body 10 that includes opposing walls 14 and 16 which define a chamber 12 (see col. 5, lines 35-39 of Cabuz). Cabuz also teaches that body 10 may be constructed through molding of a high temperature plastic (see col. 6, lines 20-25 of Cabuz).

Certainly, a high temperature plastic is not a semiconductor substrate that includes one or more transistors.

On the other hand, the current application provides examples that illustrate an integrated circuit chip having a pump, where the chip includes a semiconductor substrate comprising at least one transistor. For example, Fig. 7 of the current application depicts components 40, such as MOS transistors, that are formed at the surface of a semiconductor substrate 41 (see paragraph [0056] of the published specification). In this example, other features of the integrated chip are also described, such as metal interconnects and other components. Cabuz discloses no such structure where a pump is disposed in an integrated circuit chip having a semiconductor substrate with device components.

Thus, for at least the reasons discussed, independent claim 29 is believed to be in condition for allowance.

Comments on New Dependent Claims 30-42

For at least the same reasons as for independent claim 29, each of claims 30-42 which depend from claim 29, should also be allowable. However, Applicant reserves the right to specifically address the patentability of dependent claims, if deemed necessary.

Regarding dependent claim 39, Cabuz does not disclose a second opening that provides fluid communication to the pumping volume through the conductive layer and the second opening being positioned closer to a border of the cavity than the first opening is positioned to the border.

Figs. 11 and 12 of Cabuz illustrate an opening across from ports 122 and 124 that may appear to be positioned closer to a border of the cavity than one of ports 122 or 124 is positioned to the border. Also, Figs. 13-15 of Cabuz depict an inlet 160 that appears to be positioned closer to a border of the cavity than an outlet 162 is positioned to the border.

However, both openings described in Cabuz do not provide fluid communication to the chamber of Cabuz through an electrode. More specifically, the opening across from ports 122 and 124 in Figs. 11 and 12 of Cabuz provides fluid communication at the opposite side of the chamber 114, and not through the electrode 130. Similarly, the inlet 160 in Figs. 13-15 of Cabuz provides fluid communication at the opposite side of the chamber 142, yet not through the electrode 154.

In addition, upon inspection of Figs. 11 and 12 of Cabuz, the ports 122 and 124, which appear to provide fluid communication through the electrode 130, are positioned at equal distances with respect to the edge of the chamber 114. Indeed, neither of ports 122 and 124 is positioned closer to a border of the chamber 114 than the other.

As a contrasting example, shown in Figs. 4 and 5 of the current application, a second opening O2 is positioned closer to the border of the cavity 2 and provides fluid communication to a pumping volume through a conductive layer 3. Accordingly, Cabuz does not disclose a second opening that provides fluid communication to a pumping volume through a conductive layer and the second opening being positioned closer to a border of the cavity than the first opening is positioned to the border.

Further, dependent claim 40 includes that, upon application of a sufficient voltage between the conductive layer and the membrane, the flexible membrane is adapted to cover the second opening and not the first opening.

Upon further inspection of Figs. 11 and 12 of Cabuz, because ports 122 and 124 appear to be positioned equidistant from the edge of the chamber 114, when the diaphragm 120 is activated to cover one of ports 122 or 124, the other port will necessarily be covered as well.

In contrast, Fig. 5 of the current application clearly illustrates an example of a flexible membrane 6 being able to cover a second opening O2 and not a first opening O1. Accordingly, Cabuz does not disclose a flexible membrane being adapted to cover a second opening and not a first opening.

New Claims 43-50

New independent claim 43 is directed to an integrated circuit chip including a semiconductor substrate having at least one transistor and at least one ventilating duct; and a pump configured to cool the chip, wherein the pump is disposed on the semiconductor substrate and is in fluid communication with the at least one ventilating duct. New dependent claims 44-50 are generally directed to additional subject matter that is found in independent claim 29, yet not included in independent claim 43. Support for these claims can be found, at least, in Fig. 7 and paragraph [0056] of the published specification.

Similarly to that discussed above for independent claim 29, Cabuz does not disclose a semiconductor substrate that includes at least one transistor. Thus, independent claim 43 should be in condition for allowance. For at least the same reasons as for independent claim 43, each of claims 44-50 which depend from claim 43, should also be allowable.


CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicants' representative at the telephone number indicated below to discuss any outstanding issues relating to the allowability of the application.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825, under Docket No. S1022.81158US00.

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